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New results on the Ge76 double beta decay with neutrinos and exotic decay modes from GERDA Phase II

Two-neutrino double beta ($2\nu\beta\beta$) decays are amongst the rarest nuclear processes ever observed. Precision studies of the electron sum energies require ultra-low background and an excellent understanding of the experiment's response. Both are key features of the Germanium Detector Array (GERDA) experiment, which searched for neutrinoless double beta ($0\nu\beta\beta$) decay with enriched high purity germanium detectors in Liquid Argon at Laboratori Nazionali del Gran Sasso (LNGS) in Italy. The measurement of the Standard Model $2\nu\beta\beta$ decay half-life of ^{76}Ge was performed with unprecedented precision, profiting from the high signal-to-background ratio and the small systematic uncertainties. It provides essential inputs for nuclear structure calculations, that benefit the interpretation of $0\nu\beta\beta$ decay results. Furthermore, the search for distortions of the $2\nu\beta\beta$ decay spectrum allows exploring new physics, like $0\nu\beta\beta$ decay with Majorons emission, Lorentz invariance, or search for sterile neutrinos.

The new results of the ^{76}Ge $2\nu\beta\beta$ decay half-life and improved limits on exotic decay modes will be presented in this talk.

Primary author: BOSSIO, Elisabetta (Technische Universität München (TUM))

Presenter: BOSSIO, Elisabetta (Technische Universität München (TUM))

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